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COVER: Cinchona seeds are so small that several hundred of them can be placed on a spectacle lens as shown in the photograph. These are some of the seeds which were flown out of the Philippines at the time of the Japanese invasion and will be used to increase cinchona production in this hemisphere (see p. 351).

The Way To

MUCH as the pharmacist may regret it, nearly all the vitamins needed by normal persons will continue to be sold at the grocery—in foods. And still more vitamins will be ingested *via* fortified or enriched foods, for these products are scheduled for far wider use on post-war tables. The current fad in shotgun vitamin preparations will pass, as knowledge of the adequacy of a balanced diet filters down through the various strata of society and research reveals the true place of vitamins in nutrition and therapy.

Does this mean that vitamin volume is doomed as a profitable, ethical phase of pharmacy? Not at all. Investigations are being conducted all over the world, even now, that promise to expand the use of vitamins in a dozen different directions—not only of those already on pharmacy shelves, but of some that have not yet been recorded in a laboratory notebook.

The subtle effect of vitamins on patients with subclinical deficiencies, and the thousands of capsule swallowers already on adequate diets to whom vitamins can be of no value—observation of these is what leads men like Westbrook Pegler to pooh-pooh one of the greatest pharmaceutical and medical developments in history. "Dr." Pegler has already had his ears scientifically pinned back by several rebuttalists, and hardly deserves more attention.

Of his argument that much vitamin advertising approaches the patent medicine ballyhoo of yesteryear, however, pharmacists are not likely to have heard the last. Can it be denied that the public is under a word barrage telling of *predisposition* to the whole gamut of diseases that *may* occur *if* sundry deficiencies are present? The war-jittery and overworked consumer skips those italicized words, eager to find a new "tonic" in his disillusionment over the herb potions of his father's day.

Here the pharmacist can discharge his responsibility, and at the same time increase his prestige without deflating his pocketbook, by guarding against this pernicious trend of vitamin dosing when a customer needs "pepping up," wants a "tonic," or "just isn't feeling well." Under such circumstances the use of a shotgun vitamin preparation may delay correct diagnosis and medication just as surely as one of the old nostrums.

Aside from this the pharmacist can apparently distribute vitamins to his heart's content without harm, for most of them seem to have no toxic properties in the amounts ordinarily used—and some good may be done. To dispense vitamins rationally, of course, we should keep in mind the average daily requirements for adults, realizing that even those on a relatively poor diet will get most of their vitamins in foods. Here is the current picture as summarized from the medical literature.

For vitamin A, 5000 U. S. P. units is generally accepted as the daily requirement. It now seems to be well agreed that administration of this vitamin during an infection will have little effect on the outcome unless there is a deficiency. As there are many other factors of greater influence in infections than vitamin A, there is so far little reason for calling it the "anti-infective vitamin"—except as a sales point.

Since vitamin D is ordinarily supplied by the action of sunlight on cholesterol in the skin, the amount needed still seems to be a disputed question despite the mass of research reports that have accumulated on this subject. The literature suggests that those who do not get even a seasonal exposure to sunshine should be provided 400 to 800 U. S. P. units of D, either in foods or concentrated form.

The use of vitamin K has been one of the

Looks To Us

most recent dramatic successes of vitamin therapy. Although little is known of its intimate physiological function, a deficiency shows up as a lack of prothrombin formation. The best-known bleeding disorder for which K is used is hemorrhagic disease of the newborn. Like some of the other deficiencies, a lack of vitamin K is often not due to insufficient intake, but due to an underlying pathology which hampers absorption and storage.

For vitamin K to be properly absorbed, a sufficient amount of bile salts must be present. It has also been found that excessive amounts of liquid petrolatum taken in conjunction with the diet may hamper absorption. Although minimal requirements for vitamin K remain unknown, 1 to 2 mg. of pure vitamin K_1, or a synthetic compound of vitamin K activity, is considered capable of correcting most deficiencies. Of the synthetic compounds investigated, menadione seems to have the strongest antihemorrhagic activity, being about three times as active as vitamin K_1.

Even the poorest diet seems to have enough vitamin E and it has never been shown that a deficiency of this substance ever occurs in man. Its reputation as the anti-sterility vitamin has been a difficult one to squelch, and E still appears in some multi-vitamin products.

Thiamin is one vitamin that apparently is not adequately supplied in the diet, except when whole grain cereals and enriched bread are eaten. An estimated 1.5 to 2.3 mg. per day is needed. Daily requirement for riboflavin is slightly higher, being placed at 2.2 to 3.3 mg. Nicotinic acid is a B complex component for which it has been difficult to determine the daily requirement. About 15 to 20 mg. daily is suggested, half of which would be obtained in a serving of lean meat. Even more elusive have been the daily requirement and mechanism of function for pyridoxine. Animal experimentation indicates that about 2 mg. may be needed daily. In any case the average diet is probably more than adequate. Should someone ask about pantothenic acid, the most that can be safely answered is that its function, significance and requirement in normal man remain unknown. Some say that about 5 mg. is needed to prevent deficiency, an amount probably included in rather poor diets.

Although the literature reveals little clinical information on the use of choline, this important member of the B complex is in some way related to fatty acid mobilization in the body. Biotin has been in and out of the science news periodically, and now that the crystalline form is becoming generally available, the development of clinical applications should be forthcoming. Inositol still remains pretty much a mystery member of the B family with little indication of its possible significance in nutrition.

Folic acid, isolated for the first time during the past year, is another member of the B family. It is the first vitamin to be definitely linked with white blood cell production. The use of folic acid may result in safer administration of the sulfa drugs as it will cure the anemia and white blood cell destruction sometimes caused when sulfa compounds are prescribed.

Last but not least of the water-soluble group is vitamin C with a daily requirement of 75 mg.

In a brief look at the vitamin lineup, we see that much remains to be done in determining just what role the vitamins do play in normal metabolism. More is known, much of it empirically, as to how they can be used clinically. Although current research is likely to make therapy more complex, the true role of vitamins in pharmaceutical practice will be of even greater importance in years to come.

Pharmacists Can Produce Penicillin

PROFESSIONAL PHARMACISTS CAN NOW PRODUCE SUPPLY OF BACTERICIDAL MOLD CHEMICAL FOR TOPICAL APPLICATIONS

A "KITCHEN method" of producing penicillin gauze may make the badly needed bactericidal mold chemical available for topical application throughout the country. The simplified procedure was proposed to the Industrial Hygiene foundation by Dr. Julius A. Vogel, plant physician for the Jones and Laughlin Steel Corporation.

At an initial outlay of less than five dollars, the penicillin dressings can be produced at a cost of less than five cents each. The mold is grown in large Petrie dishes, the penicillin being deposited on gauze placed on the bottom of the dishes.

Many pharmacists in hospitals and professional pharmacies should be able to furnish physicians with a supply of penicillin dressings by using the method proposed by Dr. Vogel. Because the pharmacist's services are available to a group of physicians, continuous production can be conducted efficiently to supply various clients with cultures at the required age of four to twelve days.

Only those with a knowledge of sterile procedure should attempt to grow penicillin gauze dressings, as the cultures must be maintained pure. Each Petrie dish must be checked microscopically by either the producer or physician for possible contamination before the dressing is applied. Otherwise there is danger of neutralizing the penicillin or introducing a secondary infection.

Those who are not in a position to undertake such a project may wish to remind physicians that penicillin gauze can be produced by this method.

A pure culture of *Penicillium notatum* to start production can be obtained from any reputable bacteriologist or medical school.

The method of producing it follows that of Dr. George H. Robinson and Dr. James E. Wallace of the Allegheny General Hospital, Pittsburgh (*Science, Oct. 8, 1943*), but instead of using the expensive, complicated apparatus of a modern laboratory, ordinary kitchen equipment is used instead.

A supply of 150-mm. Pyrex Petrie dishes is first washed in soap and water, rinsed and dried. Then 28 by 24 mesh absorbent gauze is folded into eight thicknesses. Circular patches of this folded gauze, the size of the base of the Petrie dish, then are cut out and placed in the dish and covered with the lid. The entire Petrie dish containing the gauze is then placed into a bake oven for one-half hour at a thermostat temperature of 400° F. If the accuracy of the thermostat is doubted, a safe method is to apply heat until the gauze begins to show a slight tinting of scorch. They are then removed from the oven and allowed to cool. Using a glass-marking pencil, the date of culturing them is written on the top of the glass so that successive cultures cannot be confused with one another.

To conserve time the culture medium is prepared, and a one-pint bottle and its screw cap are sterilized by boiling in water for 20 minutes, while the Petrie dishes are sterilizing in the oven.

The medium is prepared in the base of a Cory glass coffee maker. One pint of distilled water is placed in the container, and to it are added dehydrated yeast, drachms one and one-half, and glycerin, drachms three. Then a separate

mixture of dextrose, drachms three; corn starch, drachms three; and cold distilled water, one ounce are thoroughly mixed in a teacup. This is then added to the contents of the Cory glass coffee maker, stirred well and boiled for 20 minutes over a low flame. At the end of this time the bottle and screw cap are removed from the boiling water, making certain not to contaminate the lip of the bottle or the inner side of the screw cap. The boiling solution is immediately poured into the bottle and sufficient boiled distilled water is added to fill it. The cap is applied and it is shaken well to produce a homogeneous mixture.

When the Petrie dishes and the culture medium have cooled sufficiently, the neck of the bottle is wiped off with a gauze sponge saturated with 70% alcohol. In a few minutes the alcohol has evaporated from the surface and two ounces of medium is poured into each Petrie dish, raising one side of the lid of the Petrie dish sufficiently to admit the mouth of the bottle while at the same time being careful not to touch the Petrie dish with it.

A flamed platinum loop is then touched to the stock culture and transferred to the plate by stroking the loop across the medium several times. The dish is then turned one-quarter of a circle and the plate stroked again with another loopful of culture.

The cultured dishes are then placed in a safe place at room temperature. Optimum temperature for growth of the mold is 72 to 74° F.

The first growth of the mold is evidenced in 24 hours by the appearance of numerous "snail tracks" on the surface of the medium. Soon the entire surface becomes pure white with mycelial growth. In several hours the growth changes in color into a light dusty green which soon deepens into a dark green, and finally if allowed to grow long enough becomes almost black. At about the age of five days, small yellow-hued globules appear on the surface of the mold. This is pure, crude pencillin, and has an inhibitory titre to Staphylococci in dilution of 1:20,000.

The penicillin which is secreted during the growth processes of the mold is mainly deposited on the under surface of the gauze and is of an unmistakable deep yellow color. The formation of penicillin reaches its maximum in 12 days, then rapidly retrogresses during the next two days. Hence the penicillin gauze is used when it is from 4 to 12 days old, the lower figure being the earliest age at which sufficient penicillin has been secreted to be effective.

In use by a physician, a section sufficiently large to cover the infected area is cut from the penicillin gauze with sterile scissors and applied yellow side next to the wound. This is then covered with a single thickness of 28 by 24 gauze cut slightly larger than the patch and bound down securely along the edges with adhesive. Penicillium is aerobic, requiring the presence of air to continue secreting penicillin.

Thus the living Penicillium continues secreting its penicillin all the time the patch remains *in situ*. The mold itself is not a pathogen, being present in abundance on the skin and even in the air we breathe.

Reactions Rare

Reactions from penicillin are very rare, an extremely high dosage of penicillin being required to produce toxic effects.

Perhaps it should be mentioned that no topical antiseptic of any kind is applied to a wound when penicillin treatment is once begun.

The disadvantages of this method of use of penicillin are: first, penicillin gauze can be used only between the ages of 4 and 12 days, thus requiring periodic preparation in order to have it on hand at the correct age when the occasion for its use arises; second, the penicillin is in the crude state and is present in such small quantity that it cannot be refined and used intravenously for a septicemia or pneumonia or for any infection that is not in or near the surface of the skin.

The advantages of this method of use of penicillin are: first, the ease with which it can be produced by anyone having only a rudimentary knowledge of sterile procedure; second, the speed of propagation; third, the low expense of producing it; fourth and most important to the practitioner, the dramatic swiftness with which it cleans up and heals staphylococcal and several of the other coccal infections.

With the use of refined penicillin limited to the armed services and to experimental civilian practice, Dr. Vogel's work seems to show that surface pyogenic infections can be treated by crude penicillin by the physician on Main Street, U. S. A., or even in the most remote hinterlands where no laboratory facilities exist. The results of treatment by penicillin locally has been demonstrated clinically. In a few cases, the results have been disappointing; but many have responded with incredible rapidity.

Another Brain . . .

CARD INDEX FOR THE PHARMACY

by H. A. K. WHITNEY

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UP-TO-DATE FILE OF LATEST PROFESSIONAL INFORMATION ENABLES THE PHARMACIST TO PROVIDE IMPROVED SERVICE

WHEN a physician is on the other end of a telephone wire or a customer makes a hurry-up request for service, a pharmacist often wishes he could put his finger on that drug information he heard about a while back. A card index placed in the prescription department near the telephone will provide the pharmacist with an extra "brain" that will greatly extend his fund of professional knowledge at a moment's notice.

The appended list of titles for such an index system has been found practicable by the writer through many years of use. It may or may not be suited for your purposes. But it can be adapted to serve the needs of any pharmacist—retail, hospital or manufacturing—by deleting and adding titles to suit his particular needs and point of view.

The utility of any system depends on several factors: (1) accurate filing; (2) proper and sufficient cross indices that will permit entries to be found at a later date, whether you recall the drug, its general type or its therapeutic applications; (3) care in selecting material for indexing.

Practical bits of useful information can be gathered from journals, pamphlets, books, notes from meetings and discussions, and promotion pieces from pharmaceutical manufacturers. Indexing should be done while you read or listen. Whether your file card lists a publication reference or notes, it should be topped by a subject heading and specific information on the source of material.

The use of three- by five-inch cards is suggested because a great deal of information that is worthy of saving is printed on this size card by manufacturers. Many small folders also have a format that can be trimmed to the three-by-five size and filed.

The suggested list of alphabetical titles will help you to get started, but you will find that details arise which give the system a personal touch. For this reason the index will be most usable if you do the work yourself, rather than turn the filing over to an assistant or clerk. It is suggested that a decision be made on nomenclature—then stick to it. For example, the file labeled "Epinephrine" should contain all references to Adrenalin, Adrin, Suprarenin, Suprarenalin, etc. Conversely, it has been the experience of the author that a classification such as "Sulfonamide," at one time sufficient, must later be broken down into more specific names—Sulfamerazine, Sulfapyridine, Sulfadiazine, etc.

Since most entries could be classified at least two ways, such as chemically and therapeutically, the use of cross references between sections of the file is a valuable feature. Extensive use of "See" and "See also" will help greatly.

As a pharmaceutical file must preserve the therapeutic uses of the drugs and chemicals, and expand with progressing research, it is well to guard against crowding the file with too-little-used or insignificant applications. Be careful about cluttering the files with the "one case series" type of report—if necessary keep the one case in mind until the work has been proved.

Soon the file will be providing all manner of information. It will supply formulas of products for detailing projects. Data on new products not yet in the reference books will be found there. Unfamiliar dosages can thus be checked. Information on various ointment bases, vehicles and flavoring agents can be quickly located. Permissible replacements for war-scarce materials have their place these days. Other sections of the index will develop to fill special needs of each pharmacy.

A little experimenting with the system should soon give the pharmacist an indexing habit that will enable him to give profitable, improved service.

SUGGESTED INDEX TITLES

A

Acacia
Acetates
Acids: *see* anions, as Amino, Nitric etc.
Adrenals
  Whole
  Cortex
  Medulla
Agranulocytosis
Alcohols
Alkalis: *see* cation, as Sodium, Potassium, etc.
Alkaloids
Allergy: *see also* Bacteria, Pollen, Epidermal, Fungi, Food, Asthma, etc.
Aluminum compounds
Amebicide
Aminoacetic Acid
Amino Acids
Ammonium compounds
Ampuls: *see also* Parenteral, Sterilizing Process
Analeptics
Analgesics—Antipyretics: *see also* Salicylate, Cinchophen
Analysis
Androgens (Hormone)
Anemias
Anesthetics
  Local
  General
  Basal (Barbiturates)
Antacids
Antemetics
Anthelmintics
Antidotes
Anti-infectives: *see* Antiseptics, Sulfonamides, etc.
Antimony compounds
Anti-nauseant: *see* Antemetics
Antioxidants
Antipruritics
Antipyretics: *see* Analgesics
Antiseptics
Anti-spasmodics
Apparatus
Aqua: *see* Water
Arsenic
Arthritis
Assays
Asthma: *see* Allergy
Astringents
Autonomic drugs
  Symp.: Vaso-constrictor
  Parasymp.: Vaso-dilator

B

Bacteria: *see* Biologicals, Allergy, Sera, etc.
Barbiturates
Bedsores
Belladonna series
Bile Compounds—Extracts
Biologicals
Bismuth
Blood
  Bank
  Plasma
Books, Journals, etc.
Bromides
Brucellosis
Burns

C

Calcium
Cancer
Capsules
Cardio-vascular: *see* Digitalis, Nitrites, etc.
Central Nervous System: *see* Analeptics, Gases, etc.
Chaulmoogrates
Chlorides
Choleretic: *see* Bile
Cholines
Cinchophen (Analgesics)
Citrates
Colitis
Collyria (Ophthalmology)
Colors, F. D. A.
Cosmetics: *see* Deodorants, Depilatories, etc.
Cough formulas
Cresol: *see* Phenol
Cyanides

D

Decubitis: *see* Bedsores
Deodorants (Cosmetics)
Depilatory (Cosmetics)
Dermatology: *see* Ointments
Detergents: *see* Wetting Agents
Diabetic Agents
Diagnostic Aids and Tests
Diarrhea
Digestants: *see* Gastro-intestinal
Digitalis: *see* Cardio-vascular
Diuretics: *see* Xanthine, Mercury
Drugs, crude
Dyes: *see* Stains
Dysentery: *see* Diarrhea, Amebicides
Dysmenorrhea (Gynecology)

E

Ecbolic: *see* Oxytocics
Eclampsia: *see* Analgesic, etc.
Elixirs
Emetics: *see* Antemetics
Emulsions
Enzymes
Ephedrine: *see also* Epinephrine, Vaso-constrictors
Epidermal: *see* Allergy
Epinephrine: *see also* Vaso-constrictors
Ergot preparations
Estrogens (Hormone)
Expectorants: *see* Cough formulas
Experimental

F

Flavoring agents
Fluidextracts
Fluorides
Foods: *see also* Allergy
Fungi and Fungicides: *see also* Allergy

G

Gases, therapeutic
Gastro-intestinal: *see also* Antacid, Stomachics, etc.
Geriatrics
Germicides: *see* Antiseptic, Preservatives
Glycerites
Glycosides
Gold compounds
Gonorrhea (Sulfonamides)
Gripe File
Gums: *see* Mucilage
Gynecology

H

Halogens: *see* Bromides, Chlorides, Fluorides, Iodides
Hematics: *see also* Hematopoietics, Hemostatics
Home recipes
Hormones: *see also* gland names
Hydrotherapy
Hypnotics—Sedatives

I

Incompatibilities
Inhalants: *see* Nebula
Insecticides
Insulin preparations
Iodides
Iron compositions: *see also* Hematics
Isotonic factors

J

Jellies: *see* Mucilage

L

Lactates
Laxative: *see* Cathartics
Lead compounds
Leprosy
Liniments
Lotions

M

Magmas: *see also* Mixtures, Emulsions
Magnesium
Mandelic Acid
Media
Mercurials: *see also* Antiseptic—Diuretic
Metabolic agents: *see* Calcium, Iodides, Amino acids
Metrology
Migraine
Miotics
Mixtures
Mold extracts: *see also* Allergy, Penicillin, etc.
Morphine and substitutes: *see also* Narcotic
Mucilages: *see also* Gums, etc.
Myasthenias
Mydriatics

N

Narcotics: *see also* Morphine, Analgesics
Nebula, Inhalants, etc.
Neurology
Nitrites-Nitrates: *see also* Cardio-vascular, Vaso-Dilators
Nostrums
Notice Judgment FDA

O

Obstetrics
Oils
Ointments: *see also* Pastes, Dermatology
Ophthalmology: *see* Collyria
Opium: *see also* Morphine, Narcotic
Otology
Oxytocics (Ecbolics)

P

Parathyroid
Parenteral preparations: *see also* Sterilization Process, Ampuls
Pastes (Ointments)
Pediatrics
Pediculosis
Pemphigus
Penicillin
Perfumes
Peroxides
Pharmacy
  Aids
  General
  Hospital
  Manufacture
Phenols, Cresols
Phosphates
Photographic ℞
Physiotherapy
Physostigmine series
Pituitary
  Whole
  Anterior
  Posterior
Placental preparations
Plasma, Blood
Plastics
Podiatrics
Poliomyelitis
Pollens (Allergy)
Potassium
Powders
Prescription notes
Preservatives
Proprietary preparations: *see* Nostrums
Proteins: *see* Allergy
Pruritis: *see* Anti-pruritic
Psoriasis
Purgative: *see* Cathartic

Q

Quinidine: *see* Cardio-vascular
Quinine: *see also* Malaria

R

Radioactive preparations
Radiographic preparations
Reagents: *see also* Test solutions

S

Salicylates: *see also* Analgesics
Sclerosing agents
Sedatives: *see* Hypnotics
Sera: *see* Biologicals
Silver
Sodium
Solutions
Stains: *see also* Reagents
Sterilization process: *see also* Parenteral
Sterols
Stomachics: *see* Gastro-intestinal
Styptic: *see* Hemostatics
Sugars
Sulfates
Sulfonamides
  Sulfadiazine
  Sulfanilamide
  Sulfapyridine
  Sulfathiazole, etc.
Suppositories
Surgery
  General
  Neurological
  Oral
  Urological, etc.
Suspensions: *see* Mixtures, Magma
Syphilis: *see also* As, Hg, Bi, Sb
Syrups

T

Tablets
Tannins

Test solutions: See also Reagents
Thiocyanates: *see* Cardiovascular
Thymus
Thyroid
Tinctures
Trichina
Trichomonas
Trypanocides
Typhoid
Tuberculosis

U

Ulcers, gastro-peptic
Unguents: *see* Ointments, Pastes
Urology: *see* Surgery
Urticaria: *see also* Antipruritics

V

Vaccines: *see* Biologicals
Varicosities: *see* Sclerosing
Vaso-constrictors: *see also* Epinephrine
Vaso-dilators: *see also* Nitrite
Vehicles
Venoms, Bee, Snake, Toad, etc.
Veterinary
Virus: *see* Biologicals
Vitamins, general
A, B, C, D, etc.

W

Waters
Wetting Agents: *see also* Detergents

X

Xanthines: *see also* Diuretics

Z

Zinc preparations

PHARMACISTS ACTIVE IN FEDERAL SERVICE

PHARMACISTS may soon have increased status in the Veterans Administration, as higher Civil Service ratings are in prospect and a bill has been introduced in Congress to establish a permanent Medical Corps in the agency. Pharmacists would be eligible for commissioned status in the Reserve Corps, which implies that some will be on active duty, Dr. H. E. Kendig points out in a summary report from the A. PH. A. Committee on Pharmacists in the Government Service.

If the higher Civil Service ratings are established in the Veterans Administration it is believed the way will be cleared for similar ratings in the Indian Bureau and other governmental agencies requiring the services of pharmacists.

The bill to reorganize the Public Health Service, just passed by Congress, also received the attention of Dr. Kendig's committee to assure proper standing for pharmacists.

With the establishment of a Pharmacy Corps in the Army, the committee is now turning its attention to pharmaceutical service in the Navy. Negotiations have been under way with Navy officials, but the committee confines its announcement to a report of "progress" for the present.

Plans for setting up the Pharmacy Corps in the Army are already under way and the Committee on Pharmacists in Government Service is following the various steps taken toward its organization. The project is under the supervision of Col. J. R. Hudnall.

The first important action was the transfer of the 16 pharmacy officers from the Medical Administrative Corps to the new Pharmacy Corps. This group will be in addition to the 72 commissioned officers designated in the legislation. The official insignia of the Pharmacy Corps will be a caduceus with the letter "P" superimposed.

Announcement of examinations for some of the commissions is expected soon. The educational qualification is graduation from an accredited school or college of pharmacy requiring a four-year course. The age limit is 21 to 32 years. Other requirements are the general standards for the officer personnel of the Regular Army.

"We recognize," says Dr. Kendig, "that with Army drug installations scattered all over the world today and the pharmaceutical supervision being shared by several different corps, it is impossible to transfer those duties to pharmacy officers and coördinate the service under one head overnight. But we do expect the plain intent of the citizens of the country, as expressed through their representatives in Congress, to be granted and made effective as rapidly as possible, with due regard to the requirements of the war effort.

"While the tangible results of our success are very valuable, the implications are far reaching and of the utmost importance. For the first time pharmacy has been recognized without restricting qualifications. Ultimately, this precedent will open all doors for pharmacy to participate on the proper basis where its services can be useful."

Lawyer-Pharmacist Discusses

FDA AND THE RETAIL PHARMACIST

by GEORGE F. ARCHAMBAULT

MASSACHUSETTS COLLEGE OF PHARMACY

FIVE PRINCIPAL QUESTIONS OF RETAILERS ANSWERED TO ASSURE OBSERVANCE OF THE FEDERAL FOOD AND DRUG LAW

"NOW, apparently, the period of warning is past and prosecutions will begin," THIS JOURNAL commented editorially early in the year. Such warnings in pharmaceutical journals that stores throughout the country were being checked for forbidden "over the counter" sales sent many a pharmacist on a diligent search to ferret out the Federal Food Drug and Cosmetic Act and its practical application to retailers. State Board members, educators in colleges of pharmacy and especially those connected with the field of business administration were questioned and are still being questioned by pharmacists on retail problems connected with this legislation.

It is with the old adage in mind "that an ounce of prevention is worth a pound of cure" that this brief on the law is presented.

The country now has a health law that:

1. Prohibits the adding of poisonous and deleterious ingredients to foods, drugs and cosmetics.

2. Protects the consumer against drugs being falsely labeled or advertised (see Wheeler-Lea Act also in this connection) or that are dangerous to health when used in the dosage, or with the frequency indicated on the label.

3. Covers foods, cosmetics and devices as well as drugs.

4. Outlaws misleading containers. Oversized cartons with small bottle contents, bottles with thick walls and false bottoms and bottles with long necks and impressed panels have disappeared.

5. Protects the honest manufacturers from unfair competition.

Presented by title to Section on Pharmaceutical Economics, A. PH. A., Columbus meeting, 1943.

Let us examine the five major questions concerning the retail druggist which are most commonly asked relating to these provisions.

1. "Have I any 'rights' or defenses if I sell an item in good faith, which has not been properly labeled and which was obtained from my local wholesaler or direct from the manufacturer?"

To understand properly one's defenses, one must know something concerning the legal machinery set in motion once the complaint is issued. In brief, a notice is forwarded by mail to the retailer stating the nature of the complaint and setting the date when a hearing is to be held. The purpose of the hearing is for the retailer to show cause why the matter should not be turned over to the Federal courts for prosecution. Section 303 of the Act contains a defense that may be used. In substance it provides as follows:

(*a*) If the dealer is engaged in intrastate commerce he should produce all documents and names connected with the contract of purchase.

(*b*) If the dealer is engaged in interstate commerce he should produce a "continuing" or "blanket" guarantee or an "invoice" guarantee from the vendor which guarantee states that the law has been complied with.

The "invoice" form of guarantee is by far the more common in the trade There is one word of caution concerning this defense. The Food and Drug Administration has ruled that such a guarantee is no defense to the retailer where the charge is misbranding and the item is a proprietary containing one of the so-called dangerous drugs (such as aminopyrine, thyroid or acetanilid in a dose of more than five grains a day, etc.). This regulation is based upon the law that a druggist is presumed to know the action of drugs and therefore must know which are likely to be harmful when taken in certain doses. The FDA justly states, concerning this statute, that the common law should apply and that a licensed druggist cannot relieve himself of responsibility

through the medium of such a guarantee. In such instances it will be presumed that he has acted in bad faith.

2. "Where may I obtain an 'official' list of 'dangerous drugs' which can no longer be sold over the counter?"

The Food and Drug Administration issued a list in April, 1941, pointing out that the list was in no sense a complete or "official" list and that items could be added or removed as medical evidence indicated. Copies of this list appeared in journals and many pharmacy boards distributed mimeographed notices (*see exhibit A*).

EXHIBIT A

(From a notice dated Washington, Jan. 10, 1941)

Reports reaching the Food and Drug Administration indicate that there are occurring violations of the Federal Food, Drug and Cosmetic Act by retail druggists in the indiscriminate sale of drugs manufactured in another state and labeled for restricted sale.

The Federal Act requires drugs to bear labeling giving adequate directions for use. Exemptions to this requirement have been authorized only to drugs intended for professional use or dispensed on prescription. Directions for use are omitted under the regulations, where the label reads:

"Caution: To be used only by or on the prescription of a physician or dentist or veterinarian."

The retailer is liable to the penalties provided in the Federal Drug and Cosmetic Act if he should sell otherwise than to practitioners or on their prescriptions any preparation bearing this legend on the label.

Generally speaking, the drugs which are labeled with this so-called prescription legend are those which are particularly potent or which may be a menace to health when used for self-medication.

A typical list of such drugs would include: barbiturates, cinchophen, neocinchophen, other cinchophen derivatives, cantharides (for internal use), aminopyrine, sulfanilamide, sulfapyridine, sulfathiazole, thyroid, aconite, benzedrine sulfate (for internal administration), chrysarobin or goa powder, chrysophanic acid, colchicine, colchicum, emetine, phosphides, phosphorus, radium, thiocyanates, the anthelmintic drugs, carbon tetrachloride, tetrachlorethylene, male fern (aspidium), santonin, wormseed oil (chenopodium oil), thymol.

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3. "We have products on our shelves which do not contain the so-called 'dangerous drugs' and yet these items are labeled 'For Prescription Use Only' or with a similar legend. May such items be sold over the counter?"

4. "May I repack nationally advertised products, such as cough syrups, in smaller containers and sell these smaller units over the counter?"

5. What information must I place on the labels of an "own product" that I put up myself?"

Inasmuch as these issues are interrelated and deal primarily with labeling requirements, they may be discussed by an analysis of what a label must contain to satisfy the statute. In general some seven points must be complied with.

1. The name of the product. This name cannot be a name of one of the active ingredients unless the name includes all the active ingredients. Any name that is suggestive of a disease or condition is also banned.

2. The label must state any habit-forming drugs contained in the preparation. The name and the amount of the drug must be listed immediately following the product's name. After this must follow the statement, "Warning—may be habit forming." A list of habit-forming drugs is presented in Section 502 D of the Act.

3. The label must contain a statement of ingredients. This includes all active ingredients with two exceptions:

If the product is official and labeled with an official name.

If the ingredients are non-active medicinally.

Rare Names Banned

Common and usual names must be employed in preference to rare synonyms. The quantity and the proportion of any drug or chemical mentioned in Section 502 E of the Act must be stated.

4. Statement of indication for use. The indications must be substantiated by well-known and accepted authorities. Accurate phrasing to indicate limited use is required. This particular section has brought forth the "Coughs *due to colds*," and "For *minor* bruises" legends. Adequate directions for use must be presented. There are, however, several important exceptions to these labeling requirements. Two that should

be mentioned are the legends "For Prescription Use Only" and "For Manufacturing Purposes." In such instances the regular label requirements may be dispensed with.

5. Warning statement. A warning statement against use in certain pathological conditions, or by children, or against unsafe dosage, method of administration or application must next appear on the label. This section has given birth to the numerous caution statements appearing on such drugs as castor oil (Not to be taken if pregnant), mineral oil (Do not take directly before or after meals), and numerous others.

6. Name and address of maker or vendor.

7. Net contents.

Answering question three—if a product marked "For Prescription Use Only" can be properly labeled by the retailer to cover the seven points mentioned, such an item upon being so labeled may be legally sold over the counter. In actual practice, the information needed concerning the manusacturer's product and the time element involved would be a practical bar to the preparation of such a label.

In reference to question four—that of selling from bulk—again a suitable label must be used. In this connection it is interesting to note the work done by the progressive printing firms catering to the drug profession. Many such items can now be purchased in bulk packages and rebottled with specially printed labels. In some instances, manufacturers are supplying the labels with the product. The National Wholesale Druggists Association has also prepared a series of model labels for nonproprietary products in coöperation with Federal enforcement officials which are designed to comply with the Act.

Question number five concerning a "store product" involves considerable study of the product itself. In general, the seven requirements of labelling must be satisfied. The submission of the label and product to the Food and Drug Administration does not guarantee, because it is not rejected, the fulfillment of the legal requirements.

Pharmacists who do not have a copy of the "Federal Food, Drug and Cosmetic Act and General Regulations for Its Enforcement" can obtain a copy for 10 cents in coin by addressing a request to the Superintendent of Documents, Washington, D. C.

SODIUM FLUORIDE MAY BANISH DENTIN PAIN

Pain from exposed dentin, one of the commonest causes of dental discomfort in adults, may be banished by a desensitizing treatment reported by Drs. William H. Hoyt and Basil G. Bibby of Boston (*Jour. Am. Dent. Assn.*, Sept. 1, 1943). Use of the new obtundent, sodium fluoride, was developed from a method first proposed by Dr. E. H. Lukomsky of Moscow, Russia. Some dental practitioners are already using the method in their regular practice and considerable demand is expected to develop for the following preparations which are used in the procedure:

(1) Aqueous solution sodium fluoride, 4%

(2) Sodium fluoride..... 1
White clay..... 1
Glycerin..... 1

A pledget of cotton is moistened with the solution to give the area to be treated a preliminary cleaning. After isolating the area with cotton rolls and removing free moisture, a small amount of the 33% paste is applied with a small plastic instrument and rubbed vigorously on the sensitive surface. This is continued by the dentist until all sensation disappears, usually taking from one to five minutes.

If pain becomes acute, usually a sensation of intense cold, the paste is washed off and a second application then made without difficulty. When used to relieve pain of cavity preparation in sensitive areas, the shock of direct application of the paste to freshly exposed dentin may be minimized by first soaking the cavity with a 1% and then a 4% sodium fluoride solution before the paste is used.

On the basis of a large number of treatments, including those given to a well-controlled group of 70 patients, the report shows that sodium fluoride is an extremely effective agent in desensitizing dentin, the effect lasting for many months. Because of the toxicity of the drug used, the researchers warn that the treatment should be used at all times with caution.

War Crisis and American Drug Culture

PHARMACEUTICAL COMMITTEE TO SAFEGUARD OUR DRUG SUPPLIES SUGGESTED BY COL. A. FISCHER AT NEW JERSEY A. PH. A. MEETING

See Front Cover

TO SAFEGUARD the United States against complete dependence on foreign sources of botanical drugs and resultant crises in times of economic and military conflict, a standing committee representing all branches of pharmacy should constantly accumulate information on our sources of supply, possibilities of domestic production and location of specialized personnel. This suggestion was offered by Col. Arthur F. Fischer during an address before members of the Northern New Jersey branch of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Col. Fischer has played a dramatic role in promoting cinchona production in this hemisphere. If the production program has gone into action "too little and too late," as some charge, it is through no fault of Col. Fischer, who was one of the few men who realized the implications of our almost complete dependence on the Far East and actively urged that something be done about it long before the war.

The same dependence on Java quinine prevailed in the Philippines more than a quarter century ago when Col. Fischer was then chief of the Forest Service there. Only a few specimen trees, all of low alkaloid content, were on the islands. These were grown with other plants of pharmaceutical value primarily to acquaint pharmacy students with drug sources. Soon after the close of the first global conflict a malaria epidemic broke out among the Forest Service personnel.

"The auditor refused to furnish the quinine for free distribution through the Bureau of Health," Col. Fischer told the New Jersey pharmacists, "and personnel had to purchase it in local 'boticas' where prices were high. I knew of places where 20 centavos, 10 cents in U. S. currency, was charged for a five-grain tablet. The death of several rangers due to lack of quinine strengthened my determination to endeavor to grow it and manufacture it for local consumption."

Over the ensuing 25 years, successful production of high-alkaloidal bark was achieved from Java seeds of *Cinchona ledgeriana*. A pilot plant was erected and manufacturing begun, producing some thousand kilos of derivatives for government personnel at a fifth the former price. This project aroused interest in the pharmacognosy and pharmacology of the Philippine flora, and the pharmacy schools began to pay greater attention to local products.

Realizing the present analogous situation here, Col. Fischer foresees "great possibilities in the Americas for the development of medicinal herbiculture. It is not even known as yet what uses may exist for many of our native plants," he pointed out. "Under the spur of the war program we have carried on widespread experimental plantings of several drugs formerly produced commercially on a large scale only in Europe, Asia or Africa. These, together with indigenous products, may form the basis for new or expanded drug industries in many countries of this hemisphere.

"Many lessons have, of course, been learned as the result of the war, some of which I hope will be useful to you and the country in the future.

"With the loss of the Philippines, the East Indies and Malaya, we became cognizant how critically dependent we were on the Far East not only for quinine but also for many other products such as tin, rubber, fibers and various drugs besides quinine, such as rotenone and pyrethrum."

Just how cognizant Col. Fischer was of our desperate need the New Jersey pharmacists were

not told, but the story of how Col. Fischer escaped from the Philippines with 2,000,000 cinchona seeds at the time of the Japanese invasion is now a favorite one with Washington botanists. On one of the last planes to get away from the islands, Col. Fischer stowed the precious seeds. When the seeds were landed in Australia, Gen. MacArthur forwarded them by plane to the United States, for he knew that cinchona seeds are short-lived.

But delay intervened, the seeds were stored unused, later to become part of the hotly debated controversy among high Washington officials concerning the efforts of the Board of Economic Warfare to further such projects.

Ordinarily, at least three-fifths of cinchona seeds that remain unplanted for as much as a year will fail to germinate. Luckily, government botanists in the Division of Plant Exploration and Introduction unearthed Dutch research reports which told of methods of keeping the cinchona seeds viable for years. The key to successful preservation was a lowered relative humidity of 30 to 40% in the storage space, and a temperature of 54 to 65° F.

Later, as the cinchona production program in this hemisphere got under way, great greenhouses at the Bureau of Plant Industry were cleared for growing seedlings from the seeds supplied by Col. Fischer. Now thousands of the potential quinine producers are sending up their green shoots and many thousands of high-quality plants have already been flown to the tropical Americas for planting. Alkaloids from the bark of these trees should some day be on the prescription shelves of United States pharmacies, and some may yet be ready in time to help alleviate the war shortage of malaria-fighting quinine.

Commenting on the years that have been lost in getting the cinchona program under way,

CINCHONA SEEDLINGS are shown growing by the thousands in government greenhouses near the nation's capital. Soon the seedlings will be flown to the American tropics to join the thousands of others that have been transplanted there. The men inspecting the potential quinine producers are U. S. Department of Agriculture experts on botanical drugs (left to right): Dr. Walter T. Swingle, F. C. Bradford and Albert W. Close.

Science Service Photo

Col. Fischer pointed out that, "If we had been more far-sighted, more realistic, we could have had plans well laid in advance for new or stepped-up production of many strategic materials in the New World in case of an emergency."

Because of the ease of procurement through brokers or import firms, it was pointed out that pharmacists, as individuals or organizations, have not bothered themselves with possibilities of a lack of supply.

Suggesting that professional associations, such as the AMERICAN PHARMACEUTICAL ASSOCIATION, set up a standing committee, Col. Fischer explained that such a group on intelligence could be compared to the master key system of large institutions.

"Each trade or professional association then would have the key of knowledge to expand within the geographic limits allowed by blockade or war. . . . The Government could then be in possession of a master key controlling all facts which will enable it to evolve an overall strategy for its participation in the entire national economic structure.

"To my mind," said Col. Fischer, "this is one of the greatest contributions your organization can offer to our country's well-being, and it will at the same time be a great deterrent to the formation of international cartels which have been so insidious in penetrating the commerce of countries whose lackadaisical professional and business men are satisfied to 'let George do it.' "

ALL CINCHONA ALKALOIDS NOW ALLOCATED

CINCHONA bark and all its alkaloids have now been placed under complete allocation. Specific authorization of WPB is required to deliver, to accept delivery, or to use these war-scarce drugs with the exception of certain "small order" deliveries. The order, issued early this month, amends conservation order M-131 and supersedes conservation order M-131a as amended.

The order continues to limit quinine, cinchonine, cinchonidine and totaquine to antimalarial use. Quinidine, which was formerly permitted for antimalarial use as well as for treatment of cardiac conditions, is now limited to treatment of cardiac conditions only.

Small orders are exempted from allocation, but require certificates by the purchaser. Small order exemptions are:

(*a*) Eight ounces of totaquine. Four ounces of cinchonine or its salts in the aggregate (uncompounded). Four ounces of cinchonidine or its salts in the aggregate (uncompounded). Four ounces of quinine or its salts in the aggregate (uncompounded).

(*b*) Two ounces of quinidine or its salts in the aggregate, unless acceptance of delivery of this amount, taken together with such person's stock of quinidine on hand on the delivery date, exceeds four ounces of quinidine or its equivalent in standard dosage form.

(*c*) Pills, tablets, ampuls and other dosage forms of totaquine, quinine, cinchonine and cinchonidine.

(*d*) Totaquine in packages of one-half ounce or less.

Purchasers buying quantities in any month in excess of the small order exemption must apply on Form WPB 2945 for specific allocation.

M-131 requires any person wishing to use quantities of cinchona alkaloids in excess of small order exemptions, to apply to WPB for allocation to use the material. The manufacture of standard dosage forms (capsules, pills, tablets, ampuls) is considered as use.

Standard dosage forms of quinine, totaquine, cinchonine and cinchonidine, also totaquine in bottles of one-half ounce or less, are exempt from allocation for delivery or use; however, pharmacists, wholesalers, physicians and hospitals buying these must certify as to the use of these drugs. Standard dosages (tablets, etc.) of quinidine and salts, in excess of four ounces, are not exempt from the Order and application must be made on WPB Form 2945 for authorization to receive.

All holders of 10 ounces or more of quinine in uncompounded form and/or four ounces or more of quinidine in compounded (tablets, etc.) or uncompounded form are required to file an inventory.

Persons requesting allocation must show inventory on the allocation form. These forms will be accepted as inventory reports. Holders of quinine and quinidine who do not apply for allocations must report their stocks of these two alkaloids by letter.

Modern Methods for SUCCESSFUL POST-WAR PRACTICE

by J. W. SNOWDEN

SHORTAGES ARE SPEEDING RETURN TO PROFESSIONALISM WHICH CAN BE PRESERVED IN PEACETIME ERA BY MODERN METHODS OF ETHICAL MERCHANDISING AND MANAGEMENT

PHARMACY is saving the drug store today. Harrassed by shortage of reliable personnel to man the erstwhile booming luncheon, electrical and miscellaneous departments, rebuffed by manufacturers busy filling war orders, the pharmacist once more has gratefully turned to his profession. Compelled to cover bare counters with vitamin products, first aid supplies and other items of a health nature, he has been surprised to find that people are interested in these things and will pay good money for them.

Having sold out the merchandise which once obscured the view of his prescription department, he is likewise learning that people will bring prescriptions to him when it looks like he is interested in prescriptions. Whether or not he will win, therefore, in his post-war battle for improved public relations depends upon his remembering just these things, and to recognize that it was the health angle to his business that saved him in '43. For the tone of pharmacy's post-war public relations will be largely set, as its pre-war relations were, by public impression. Just as it was difficult to convince the military during the recent fight for recognition that the druggist is more than a merchant, so will it be difficult to convince the civilians if the civilian sees no evidence in support of this protestation. And the temptation to fall back into his old error will be great indeed, for when the gong of victory lifts the barriers on civilian goods we will witness one of the greatest scrambles for merchandise this world has even known.

Let no one delude himself into thinking that this temptation, with all the druggists' rediscovery of his profession, will be resisted by all. The magnetic pull toward resumption of volume merchandising activities will be tremendous, particularly if he once enjoyed conspicuous success at it. Those who just naturally like merchandising better than pharmacy, who are, in fact, better trained for it and feel a certain inadequacy in being confronted with the demands of modern pharmacy, can be expected to succumb. It can also be expected that such action on the part of any considerable number of druggists will rend the fabric of understanding between the merchandising and professional elements of the retail drug business still further and bring about the final cleavage already clamored for by the latter. For in addition to abandoning the gains which pharmacy has so recently won, such renegation in the world of confused distribution bound to follow this war can reduce the profession to such anonymity that it may never again recover.

You need only look about you at the new lines the automotive supply and tire stores, the hardware stores, the grocery stores, the filling stations, have added to believe the economists when they say we are in for an era of unprecedented "fence jumping." Everybody will be in everybody else's business. And in this welter the druggist can either lose himself or he can stand out like a beacon if he will but remember that what saved him in '43 was the health angle to his business and base his operating policies on that memory. It can hardly be unexpected that the guardians of pharmacy will insist that he so base his operating policies or insist upon his divorce from the profession.

Concommitant with this insistence, however, should be an attitude of helpfulness expressed in educational material suggesting ways of successfully displacing "surface selling" with "service selling," showing the pharmacist how, if he keeps even moderately up on his pharmacy, he can conduct a successful "front end" business, augment his prescription business at the same time through confining his merchandising to health merchandise. In sickroom supplies, vi-

Presented by title before the Section on Practical Pharmacy, A. Ph. A., Columbus meeting, 1943.

tamins, household chemicals, health foods, baby goods, surgical appliances, feminine hygiene, general body hygiene and grooming—which includes toiletries and cosmetics—the pharmacist has fields which, if worked for anything like their full potentialities, will not only reward him handsomely in profits, but in distinction and the personal gratification which accompanies the higher levels of service.

New Store Plans

Merchandising by the professional store offers a field for thought which can best be advanced by the group which has always thought professionally. There is need for research, particularly in the field of store layout and fixtures for the smaller store where one full-time employee and a relief clerk could be permitted, through added efficiency, to handle sizable volume.

The revolving storage cabinet has already proved itself in the crowded prescription room. Why not, with glass shelves and partitions, use it for merchandise display and self-dispensing? A revolving cash-register stand in the center of the small store could be the key to elimination of aisles behind counters and enable the seller to work with the buyer instead of opposite him, quickly ring up the sale, make change and go on to the next customer.

Such research and resultant educational material is only hinting at the type of leadership the pharmacist's professional associations can employ to keep him safely in the fold of pharmacy and at the same time allow him expression for his yen to sell things, but in a way that will enhance and not destroy favorable public opinion. By showing up the fallacy of big, high-priced locations for the average operation, costly locations that put on pressure for volume merchandise turnover, more can be gained professionally than has been thought. There is scarcely more need for the expensive corner location for a "Community Health Service Center" than there is a need for such a location for the doctor's office.

So much of what the public thinks of pharmacy, too, is dependent upon what physicians think of him expressed in terms of how extensively they make use of his professional services. Thus professional relations are an extremely important section of public relations. In this connection it must be said that there has been an irritating tendency of late for certain doctors in high places to evaluate the demands for technical skill in a pharmacist at about the level of that possessed by any normal, not underprivileged youth. This erroneous and manifestly unfair estimation must be corrected; much material that will enable him to correct it is offered the pharmacist by his professionally-minded state and national associations.

The actual accomplishment of this job, however, must depend upon what use the pharmacist makes of this material. Fundamentally the pharmacist is a local compounder of medicines in small individual units to individual order. Instead of shrinking moodily into his shell at the very natural approach of competition from prefabricated specialties, it is simply up to him, if he believes in the soundness of his position and that he can often do it better, to sell that idea to his professional clients. Let him be not too disturbed by claims that simplification in the field of materia medica is about to depose him as a real factor in the compounding of medicines, for the simplification is largely one of nomenclature, or of the shadow rather than the substance. In a world of human differences scientific medication will always find a need for local compounding.

More Opportunities

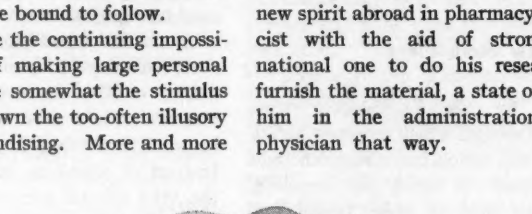
In other ways, too, the pharmacist can demonstrate his ability to work as an invaluable adjunct to the medical profession in his community. In most communities there is an urgent need for a clinical laboratory, a need which especially the newly graduated pharmacist would find not incompatible with his training and could be certainly an enhancement of his professional standing. Likewise the rental or sale of hospital equipment and all such appliances that contribute to the treatment or comfort of the sick can be productive of both profit and favorable public and professional esteem.

Beyond everything else, however, in the establishment of favorable relations with physicians, is the advantage that will come from keeping up with the latest developments. Never before have the medical and pharmaceutical professions been presented with so many dramatically new and active therapeutic agents. It can

reasonably be considered that the pharmacist's obligation extends even beyond keeping up with these advances, of being the first unbiased source of information about them. Let him picture himself as chief guardian of the health of the people in his community, let him be ever on the alert for anything which will promote this health and alleviate suffering and consider it his professional obligation to procure it and detail it, and the finest kind of public and professional relations are bound to follow.

What would look like the continuing impossibility after the war of making large personal earnings should remove somewhat the stimulus toward seeking them down the too-often illusory path of volume merchandising. More and more in our maturing national life the badge of success will be represented by service rather than accumulation. To serve enough to have enough is the concept that will displace that of scheming enough to have a million, and the opportunities for outstanding service in the field of retail pharmacy abound in a way sufficient to gratify the most ambitious.

When doctor comes marching home again it is to be hoped that he can be made conscious of the new spirit abroad in pharmacy, that the pharmacist with the aid of strong associations—a national one to do his research for him and furnish the material, a state or local one to assist him in the administration—can keep the physician that way.



PRESCRIPTION SERVICE

PROFESSIONAL PROBLEMS OF PHARMACISTS ANSWERED. BOARD OF 11 PHARMACEUTICAL SPECIALISTS AND A. PH. A. LIBRARY AND LABORATORY FACILITIES AVAILABLE TO OUR READERS. SEND QUERIES DIRECTLY TO PRACTICAL PHARMACY EDITION GIVING ALL PERTINENT INFORMATION

WORM SYRUP REQUESTED

Question: We wish to make a worm syrup containing santonin, pink root and senna. One of our physicians frequently prescribes such a product, but we are unable to obtain more of the proprietary syrup which we have been dispensing.—A. P., Connecticut.

Answer: A formula for this type of syrup is as follows:

Santonica, fine powder	av. oz.	1
Fluidextract of pink root	fl. oz.	3
Fluidextract of senna	fl. oz.	3
Oil of wormseed	drops	10
Oil of anise	drops	10
Oil of caraway	drops	10
Oil of fennel	drops	10
Syrupy glucose, to make	fl. oz.	16

This must be well shaken each time before using. The dose is one or more teaspoonfuls at intervals of 3 to 6 hours, according to the child's age, until purging commences.

It would be well, however, to call attention to the danger of using a potent remedy like santonin in a syrup of this type. Santonin is insoluble and there is always danger that by careless handling the santonin will not be evenly distributed. Overdose might result. The usual routine for the administration of santonin today is exemplified by the troches in the Pharmaceutical Recipe Book III, p. 280. We believe that an up-to-date pharmacist could well suggest that a physician use the latter type of medication rather than the syrup form.

MORE CAMPHOR NEEDED

Question: On making the following formula we have recently been getting a separation:

Camphor.....10%
Phenol.....30%
Mineral oil, heavy, q. s.

Could you offer an explanation for this?—P. H., South Carolina.

Answer: It appears that the eutectic formed by mixing the phenol and camphor must contain a higher percentage of camphor in order to effect a clear solution with the mineral oil. You will recall that phenolated camphor in the N. F. contains 60% camphor in contrast to the 10% camphor in your formula. Probably not less than 50% is required for a clear solution. Presuming that this mixture is used for fungus infections, we are inclined to believe that the higher percentage of camphor would also be helpful in rendering the phenol less caustic.

SPOTS ON TABLETS

Question: What base is suggested for making stilbestrol tablets? The last batch that was run is spotting. Do we need a stabilizer or could the trouble be in the milk sugar base?—L. C., California.

Answer: There should be no considerable instability of stilbestrol tablets. The spots may be due to traces of iron, as stilbestrol is colored by ferric salts due to the hydroxyl group present. Such contact, of course, might come through an impure diluent or through some of the utensils that are used in preparing the tablets.

CHLORAL HYDRATE TROUBLE

Question: How should this prescription be filled to prevent it from deliquescing?

Chloral Hydrate.....*gr. X*
D.T.D. Cap XXIV

I first tried adding one grain of kaolin to each capsule, then heavy magnesium oxide, sealing the mixtures in double capsules, but without success.—H. M., New Jersey.

Answer: Nothing could be found that would prevent the chloral from reacting with the capsule. Since chloral is considered to be very irritating when taken in this form, a better plan would be to recommend to the physician that the chloral be dispensed as a liquid medication. If it must be dispensed in capsule form, however, the capsules may be stored in a refrigerator to reduce the volatility of the chloral. It may also be mixed with an equal quantity of magnesium carbonate and preferably put into a double capsule, administering two or more capsules as required to obtain the desired dose.

MASKING GREEN SOAP ODOR

Question: Please suggest a way to mask the odor of Tincture of Green Soap. Since many perfumes have become scarce we have been unable to obtain a product that is pleasant and appealing to women as a shampoo.—C. W., Texas.

Answer: We suggest that you try the following combination:

Oil of Bay	2 cc.
Oil of Pimenta	2 cc.
Oil of Orange	0.5 cc.
Tr. Green Soap, *q. s.*	1 L.

HAIR LACQUER FORMULAS

With the disappearance from the market of patented hair lacquers, we would like a formula for this product using materials still available.—R. C. P., California.

The following formula for hair lacquer is suggested by R. G. Harry in *Modern Cosmeticology:*

Tincture of benzoin	20 parts
Alcohol S. D., *q. s.*	100 parts

Color and perfume as desired.

In *The Chemistry and Manufacture of Cosmetics*, De Navarre offers a similar product:

Rosin	10 Gm.
Gum benzoin	20 Gm.
Alcohol	70 Gm.

Perfume, *q. s.*

The recall from the market of certain commercial hair lacquer pads because of the dermatitis they have caused, emphasizes the advisability of careful trials of any product before its release for public use. The Food and Drug Administration has found that apparently innocuous ingredients will occasionally produce untoward reactions when combined in a cosmetic formula.

Birth Bicentennial of

FAMED PHARMACIST: M. H. KLAPROTH

by GEORGE URDANG

AMERICAN INSTITUTE OF THE HISTORY OF PHARMACY

DECEMBER FIRST MARKS TWO CENTURIES SINCE BIRTH OF APOTHECARY WHO DISCOVERED THREE ELEMENTS AND FOUNDED OUR QUANTITATIVE ANALYSIS

ON DECEMBER first just two centuries ago, in the small German town of Wernigerode, there was born the great pharmacist, Martin Heinrich Klaproth. The bicentennial is commemorated almost exactly a year after pharmacy similarly honored Klaproth's even more noted contemporary, Carl Wilhelm Scheele.[1]

Klaproth survived Scheele for more than thirty years and, to some extent, took his place in the esteem of the contemporary chemical world. In dedicating the first German collection of Scheele's publications to M. H. Klaproth, S. F. Hermbstaedt, the apothecary-editor (1760–1833) wrote: "Who is the man who could deny that you are the only one to make good the loss of Scheele! Was it not the chemists of the whole of Europe that admitted this fact to you?"

Does that mean that Klaproth was the equal of Scheele? It does not. Scheele was a unique phenomenon. Klaproth was one great chemist among others standing in the first row—but nevertheless in a row. The difference between these two men cannot be characterized better than by quotations from H. Kopp's *History of Chemistry:*

Scheele: "What Scheele did for chemistry under circumstances which almost can be called poor, after an education little fit for giving him the command of scientific means, and during a short life cut off just when he was unfolding his highest capacity—entitles him to be recognized as the chemist who, regarding all these circumstances, has no equal either in the past or in the present as to the number and importance of empirical discoveries."[2]

Klaproth: "It is beyond dispute that one German chemist of this time [about 1800], Klaproth, has his place among the foremost promoters of chemistry.[3] .... The work which was particularly his and became the pattern for all his contemporaries and those who followed was in analytical chemistry. It was he who impressed upon this branch of our science its present character."[4]

It is significant that Klaproth's scientific activity gained importance almost exactly at the same time at which failing health impeded and finally an early death closed the glorious career of Scheele.

To the chemical genius, Scheele, knowledge and experience came as a kind of natural life process. Being his own and sole teacher and learning while experimenting, he started research when he was still a youngster and almost entirely on an empirical basis. "Working by no formulated principles,"[5] he occupied himself with every chemical problem that he encountered and opened new chemical worlds.

Methodical Mind

To the methodical mind of Klaproth systematic learning had to pave the way for research. He familiarized himself with current knowledge as completely as possible before he started research of his own. Then he specialized in a particular field. It took Klaproth many years of orientation and personal contact with excellent chemists, such as Johann Heinrich Pott (1692–1777) and the apothecaries Andreas Sigismund Marggraf (1709–1782) and Valentin Rose, Sr. (1736–1771), before he really began, in 1780 and at the age of 37, the systematic work which made him known throughout the world. At this time Scheele was at the height of his success and fame.

When the bad health of the aging Marggraf,

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after 1774, made the authorities in Berlin look for some one to succeed the renowned discoverer of beet sugar as chemist of the Royal Prussian Academy of Science, it was Scheele to whom this position was offered. There was at this time not the slightest idea in anyone's mind that it could be filled by Klaproth, who was then only locally known.

Meanwhile, Martin Heinrich Klaproth performed one important investigation after the other in the laboratory of his Pharmacy at the Bear in Berlin. It is interesting that in two of the earliest of these investigations Klaproth dealt with problems which Scheele likewise had made subject to examination, and that both men quite independently came to the same results which proved wrong the opinion of two generally recognized authorities, Torbern Bergman (1735–1784) and Joseph Louis Proust (1755–1826). In the first case Scheele as well as Klaproth proved that "the new metal" found by Meyer and Bergman in cold-short iron was a compound consisting of phosphorus and iron, In the second case both of them proved the so-called "pearl acid" of Proust to be sodium biphosphate.

One of the main reasons for the sudden but lasting success of Klaproth after a slow, continuous preparation has been hinted at. It was Klaproth's capacity for self-restriction combined with a clear vision of what chemistry needed at just this stage of development. It was the fact that he, as one of the first chemists to do so, specialized and that he chose analytical chemistry as his specialty.

Discovered Elements

On this ground Klaproth became the founder of modern mineralogical chemistry and of exact quantitative analysis. He has been credited with the discovery of three elements, uranium (1789), zirconium (1789) and cerium (1803), and the verification of the elemental character of five others, strontium (1793), titanium (1795), chromium (1798), tellurium (1798) and yttrium (1801). It was finally he whom no less an authority than Berzelius (1779–1848) pronounced "the greatest analytical chemist of Europe."

Naturally this self-restriction to one specialty would not have resulted in such success had it not been based on three features of Klaproth's character predestining him for just this type of work: industry, honesty and that rare and special kind of responsibility that forces those blessed (or afflicted) with it to use their talents in the way that serves society best.

It was Klaproth's industry to which we are indebted for the abundance of detailed investigations proving the usefulness of his methods and making their adoption by the chemical world at large a matter of necessity. It was due to his honesty that he became the great purifier of the way of obtaining and reporting experimental results, thus decisively helping to make chemistry an exact science. Under these circumstances it is no wonder that the scientific world and the governmental authorities turned to him for confirmation of results obtained by others.

It was Klaproth who, in 1792, at the height of the heated argument for and against the new theory of Lavoisier, suggested an experimental check by the Prussian Academy of Science of Lavoisier's investigations concerning combustion and calcination. Finding the statements and conclusions of Lavoisier correct, Klaproth in contrast to Scheele and especially to Priestley, did

not hesitate to immediately abandon the phlogiston theory which had been the basis of his work and success. It was primarily on his initiative that the *Pharmacopœia Borussica* of 1799 was built upon the theories of Lavoisier and employed the nomenclature of the new French school of chemistry.

According to H. Kopp, Klaproth was the first to introduce, as a matter of principle, the publication of not only "the opinion of the investigator about the composition of a compound, but also and completely the details of the experiments concerned. The conformity of the total weight of the resulting substances with the weight of the employed amount of the analyzed material became now a means of checking the accuracy of the investigation and the adequacy of the methods employed. . . . The progress made in analytical chemistry since this time, the discovery of many new substances, are based solely on this way of carrying through and reporting the investigation."[6]

It was Klaproth who taught the chemists to pay attention to the possible contamination of the substances to be analyzed by minute parts of the apparatus concerned; for example, by iron originating from the iron mortars in which the material was ground. He devised methods for preparing pure reagents and is credited with having been the first to dry precipitates before weighing in order to obtain definite results.

This genuine pharmacist occupied himself not only with purely chemical problems but with pharmaceutical chemistry as well. Thus he published "Directions for the Preparation of Artificial Carlsbad Salt" and a critical study of "Bestucheff's tincture." It was the ethereal tincture of perchloride of iron of Klaproth which was adopted in most of the Continental pharmacopœias.[7]

Family Was Poor

Like many famous pharmacists, Klaproth came from a poor family. He became an apprentice in Quedlinburg in 1759 and clerked in the Court Pharmacy at Hannover from 1766 to 1768. In the library of this pharmacy he encountered books of Torbern Bergman and the Strassburg pharmacist, J. R. Spielmann (1722–1783). It was here, Klaproth states that his "love of scientific study of chemisty and pharmacy was awakened for the first time."[8] From

KLAPROTH'S BIRTHPLACE is in the small German town of Wernigerode.

1768 until his death on January 1, 1817, Klaproth lived in Berlin with only half a year interruption, from fall 1770 to spring 1771, when he occupied a position as a prescription clerk in the renowned "Ratsapotheke" at Danzig. In 1771 he became the collaborator of the owner of the Pharmacy at the White Swan at Berlin, Valentin Rose Sr. When the owner died after only four weeks of this association, Klaproth became the manager of the Pharmacy. In 1780 he purchased the Pharmacy at the Bear at Berlin, formerly owned by the family Marggraf, and remained a practicing pharmacist for another twenty years in spite of all the offices and honors which were bestowed upon him in rapid succession. And most of these offices were by no means sinecures, but asked for much work and carried heavy responsibilities.

The Prussian government took advantage of the knowledge and experience of this apothecary in making him a member of the medical administration. Scarcely two years in business on his own, he was appointed "Assessor" at the Obercollegium Medicum, steadily advancing to higher positions within this governmental department and entrusted with the inspection of pharmacies

and the examination of pharmacists. Klaproth became professor of chemistry at the Royal Prussian Artillery School and taught likewise at the Royal Institute of Mineralogy and Mining. The Royal Prussian Academy of Science elected him a member of the physical class in 1788. In 1800 his hour of triumph arrived when he was entrusted with the office of chemist of the Prussian Academy of Science as successor to Fr. K. Achard. The incumbent of this position was to reside in the house in which the laboratory of the Academy was lodged. It was for this and only for this reason that M. H. Klaproth sold his pharmacy and at 57 ceased to be a practicing pharmacist. That he did not cease to consider himself a member of the profession becomes obvious from the fact that he remained president of the Association of Pharmacists of Berlin until 1806.

When the University of Berlin was founded in 1810, the then 67-year-old pharmacist became the first full professor of chemistry at this new center of learning.

Showed Courage

George Edmund Dann gives an example of the sense of justice and the courage with which the modest Klaproth more than once surprised his contemporaries. Without any reason other than his antisemitic feelings a student at the new University of Berlin struck the face of a Jewish fellow student with a dog-whip in the presence of many other students. The case came before the senate of the University for judgment. Klaproth was the only member of the senate who insisted upon the relegation of the culprit from the University, while all his colleagues pleaded for leniency.[9]

There is another little-known event proving the courage and, simultaneously, the scientific curiosity of Klaproth. In 1783 the first balloon manned by human beings ascended at Paris. The scientific circles of Berlin were eager to see this experiment repeated in the German capital and to make it subject to scientific investigation. The difficulty was to find some individual equipped with the scientific knowledge required and courageous enough to take the risk of the ascension. "Finally there was found," says a contemporary report, "the daring individual wanted in the person of the Assessor Klaproth." This Assessor Klaproth who, on October 16, 1784, ventured the flight in a montgolfière armed with instruments for the determination of air pressure, etc., was no one else but the then 40-year-old apothecary, Martin Heinrich Klaproth. As the balloon was torn and rose only to a height of ten meters, the flight did not yield the scientific results hoped for. The venture, however, added another deed to the many performed by Klaproth and made him the first German aeronaut. It is a peculiar coincidence that the very first human beings to dare a balloon ascension, the Frenchman Pilâtre de Rozier, was likewise an apothecary.[10]

Merit Recognized

Although in 1814 a stroke diminished Klaproth's capacity for work, he retained his office at the University until his death on January 1, 1817. The esteem that he enjoyed was so great that for two years the authorities concerned were to seek for a chemist great enough to be considered an adequate successor to Klaproth. When finally the merited Berlin apothecary, S. F. Hermbstaedt, was given the position it was only because nobody of greater stature was available.

J. J. Virey, himself an apothecary with remarkable merits in chemistry, stated in paying homage to the achievement of the deceased that, "We know how often the erudite Vauquelin, his most dignified competitor, rendered justice to the profound work of Klaproth."[11]

The great pharmaceutical educator and journalist, J. B. Trommsdorff (1770–1837), certainly expressed the opinion of the contemporary world of chemistry when in his obituary on Klaproth he wrote:

"The first day of the current year [January 1, 1817] has deprived us of a man to whom the sciences and especially chemistry are indebted immensely, whose merits are generally recognized, and whose important discoveries have secured for him the palm of immortality . . ."[12]

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It Pays to MANUFACTURE IN THE HOSPITAL

by LAWRENCE TEMPLETON

UNIVERSITY OF ILLINOIS COLLEGE OF PHARMACY

COMPOUNDING PHARMACEUTICALS UNDER CONTROL SYSTEM IN THE HOSPITAL PHARMACY PROVIDES PHYSICIANS WITH A FLEXIBLE, ECONOMICAL MEDICATION SOURCE

CAN the value of pharmaceutical manufacturing be clearly demonstrated to the hospital administration?

Should only the larger hospitals consider manufacturing?

"Yes," is the writer's answer to the first; "no, not necessarily," answers the second of these two questions which ofttimes arise when manufacturing in the hospital pharmacy is being considered. Nothing is so convincing as success, and this is to be found in both large and small hospitals where the pharmacy has undertaken manufacturing.

The following viewpoints arise from experience in supervising pharmaceutical manufacturing in the hospital pharmacy associated with the University of Illinois College of Pharmacy, which supplies the Research and Educational Hospital. In comparison to the average hospital pharmacy engaged in manufacturing, our scale of operations might be classified as large. The annual report for the calendar year of 1942 discloses the manufacture of 1200 gallons of liquids, a ton of ointments, 800,000 tablets, and many other items. Volume for this year will be considerably greater as more products are being manufactured which were formerly purchased. The report does not include parenteral solutions which are manufactured in a separate unit of the hospital pharmacy.

From the operation of this manufacturing unit, a conviction has been formed of the feasibility of such an undertaking. In the operation of a comparatively large unit the role of a much smaller unit is readily envisioned.

Conversations with individual hospital pharmacists and group discussions both give the impression that the majority of hospital pharmacists believe that the practice of hospital pharmacy should be limited to filling orders, compounding prescriptions and dispensing or repackaging products manufactured by the pharmaceutical concerns. It is possible that many pharmacists do hold this opinion, as they already carry a maximum burden of duties. On the other hand, it may be argued that the establishment of a manufacturing unit may provide the means for the employment of an additional pharmacist. Manufacturing might not require all of the time of this pharmacist who could otherwise assist with diverse functions of the pharmacy.

Cost, quality and service—these are the three important features of supplying pharmaceuticals to a hospital.

Proposing increased expense to the hospital through the employment of additional help and the purchase of equipment must be justified economically with concrete evidence. This can be supplied by figures showing the cost of materials, estimated cost of manufacture, cost of necessary equipment, depreciation of machinery and the production time required. It should be possible to obtain this information from hospital pharmacists who have successfully operated a manufacturing unit, preferably from those using approximately the same amount of products as your own would use.

Except for occasional instances, the cost of producing pharmaceuticals in our laboratory is less than the cost of buying them on the open market. Obviously, this advantage would not exist if certain products were manufactured in smaller lots. There are many other products, however, whose manufacture is adaptable to small-scale production.

Most of the liquid preparations, for example, employ little equipment for manufacture, if any. In this group may be listed such commonly used

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products as syrups, elixirs, aqueous and alcoholic solutions, mouth washes, deodorant solutions, nasal and ophthalmic solutions, baby oils, etc. A mechanical mixer with variable speeds and of suitable size is usually practical. Mechanical filtering equipment is recommended for quantities over five gallons.

A mixer of the type used in bakeries is suitable for mixing ointments, either by the cold process or when the base is melted. An ointment mill is a necessity for the quantity production of smooth ointments containing undissolved solid material.

Tablet manufacture is an art unto itself about which general information is of limited value. Even with specific information, allowances must be made for the experience of the operator, the conditions of manufacture and the equipment. It has been our experience that the amount of material lost in the manufacture of tablets remains practically the same regardless of the size of the lot. In other words, the per cent of loss for a lot of 5000 would be greater than for a lot of 25,000. For some unaccountable reason a few of the commonly-used tablets may be purchased for no more than the cost of the drugs which enter into the tablet. Generally speaking, however, if a sufficient number of tablets are manufactured in lots of 5000 or more a saving may be effected and the purchase of equipment is warranted.

Savings Cited

The manufacture of two products is cited to serve as examples of economy. By the purchase of light magnesium oxide in 40-pound lots, a U. S. P. grade of milk of magnesia can be produced at a total ingredient cost of not more than 15 cents a gallon. The necessary equipment is a high-speed mixer of at least one-gallon capacity. Final treatment with a colloid mill or homogenizer is optional. For those using a considerable amount of aluminum hydroxide gel, a quality product can be produced by adding water to a concentrate at an intredient cost of about eight cents a pint. Using the precipitation process (aluminum sulfate and sodium carbonate), the gel may be produced in any quantity at about the same ingredient cost but with a higher labor cost. Formulas are available for the addition of magnesium trisilicate, kaolin or mineral oil to the gel. A high-speed mixer is required for the hydration process and also a colloid mill or homogenizer (a colloid mill preferred) for either process.

The quality of the manufactured product is of paramount importance. The first step is the topnotch quality of the ingredients. Then a system of manufacturing control should be employed. A simple system is the use of a formula card of appropriate size so that it may be used for at least ten lots, or for the calendar year. The formula should be carefully checked for correctness of calculations. In the allotted space on the formula card the initials of the manufacturing pharmacist should be placed to signify that the ingredient has been weighed or measured. The checking of all ingredients, weights and measurements by a second party should be a requirement.

Another simple method for manufacturing control is the use of work sheets transcribed from a master formula. Dates and checks for weighing and measuring are recorded on this sheet in addition to the final stamping of a control number which is also stamped on the label of the product. In many instances a sample of the product bearing the control number should be reserved for assay and as an index of stability.

Proof of the quality of the product lies in physical appearance, stability, disintegration rate for tablets and assay of the active ingredients. Initial and subsequent occasional assays should be run on many products, and, in particular, tablets. In the case of the simple mixing of ingredients previously assayed by the manufacturers, an assay of the finished product should not always be necessary provided that a definite and adequate system of control is used.

Manufacturing in the hospital pharmacy offers a special service to staff physicians who desire to use formulas which do not compare in composition to those supplied by the pharmaceutical concerns. For various reasons the physician may also desire a modification of a U. S. P. or N. F. formula. In other words, the physician is not limited to what is available on the market. Most physicians are always on the alert for better forms of medication and it is here that the pharmacist is in a position to develop new formulas for the physicians which will enhance his prestige as a pharmacist and improve the medications.

Featuring the arguments of economy and service to the hospital, backed up by investigation of hospital pharmacies where manufacturing is conducted, the hospital pharmacist should be able to convince the administration that the establishment of a manufacturing unit is worthy of consideration.

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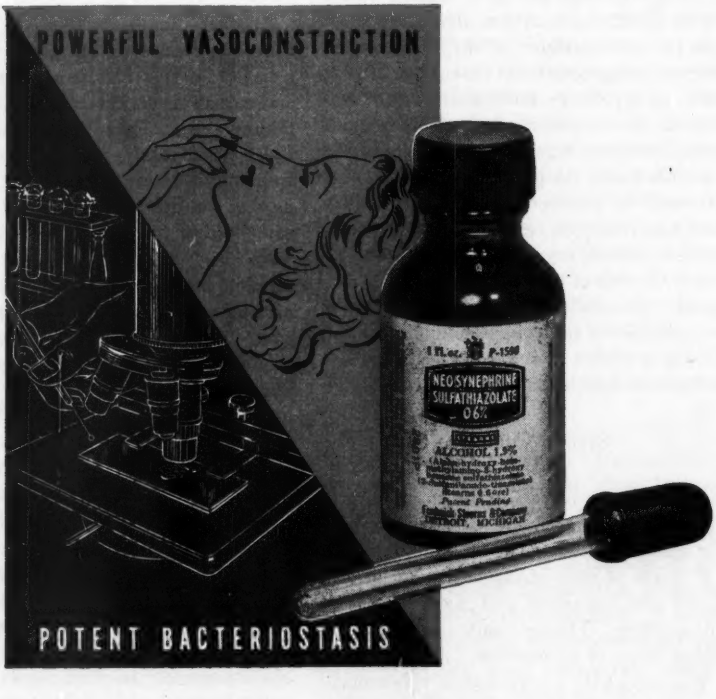

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Diagnosis of PHARMACY'S SOCIAL CONSCIENCE

by HAZEL E. LANDEEN

UNIVERSITY HOSPITAL, ANN ARBOR, MICH.

YOUTHFUL PHARMACY ANALYZES OUR ROLE IN SOCIAL STRUCTURE, FINDING NEED FOR MORE THAN GOOD PROFESSIONAL EDUCATION

GROWTH of knowledge has been likened to the ascent of a spiral stair from which the observer periodically surveys the same landscape but each time from a higher level than before. Our natural conclusion would be that with each periodic survey we would find our pharmaceutical perspective enlarged. It has taken Pearl Harbor and subsequent events to bring home to us the fact that pharmacy's perspective was out of focus; that our myopic viewpoint hadn't included the practical interpretation of pharmacy as a guardian of the health of its citizenry. Eager to help in the present emergency we are forced to a realization that in the struggle to gain and maintain strength, the profession has become weighted down by a complex superstructure of conflicting traditions and selfish interests. And in this struggle the superstructure has all but crushed pharmacy's most practical asset—idealism.

Dr. John Studebaker, U. S. Commissioner of Education, has said:

"Schools between 1870 and end of the World War were remarkably successful, one might say disastrously successful in training scientists, engineers and specialists in technical processes. This one-sided education put us in a predicament something like that which a man may experience when he gets one leg too far in advance of the other. The body politic lost its balance and control because to a considerable extent at least, the technological foot got too far ahead of the other supporting member . . . social understanding."

Is it not probable that pharmacy's lack of attention to a study of how democratic groups may control new forces in the public interest has been responsible for at least a part of the dilemma in which we now find ourselves? As practical pharmacists have we learned or taught the things which we must do as citizens, as workers and as consumers? Have we really helped young pharmacists find the information which will develop understanding and democratic attitudes? How interested have we been in seeing that they develop skills which will enable them to accomplish their purpose? What have we done to dispel the bewilderment, growing distaste and finally apathy in our younger professionally-minded pharmacists?

Those to whom the instruction and guidance of the nation's future pharmacists have been entrusted have worked long and arduously to provide the best subject matter and methods. Courses have been lengthened, some dropped and others added, old methods discarded, all with a view toward equipping the young pharmacist with those tools which will enable him to take his place in the world as a participating member of a health profession. But, in spite of these improvements the average pharmacy graduate too often has a rather difficult time making the adjustments in the world of today.

The general outlook is one in which many of our pharmacists tend to become professionally disillusioned, to take moral values lightly. The result is an undisciplined, untrained view of the ways of human intercourse, a lack of information in the regions of human endeavor.

The questions which such a situation precipitates are: In what ways has pharmacy in practice failed in meeting its obligations to the younger members? What impressions has pharmaceutical training given that are not verified in the realm of practical pharmacy? And finally, if education is to be a continuous unbroken thread, what can be done to better integrate preparation and professional fulfillment?

There are no panaceas which can be blueprinted and followed, but some of the answers may be found in analyses which have been made

of present trends in educational pursuits generally.

Pharmacy is more than a specialized and technical training. Its inherent implications are those of complete understanding, awareness and ministrations to humanity and all its perplexing problems. For this reason as a profession we should find much of value in a survey conducted by a committee appointed by the American Council of Learned Societies to study educational trends in the humanities. This survey is summarized under three headings which indicate certain pervasive characteristics of our educational system today.

Firstly, disloyalty to the ideals of liberty, equality of opportunity and genuine social consciousness were found to be glaring faults in our educational attitude. Loyalty to the ideal of liberty has too often been supplanted by expression of self-will, impatient of discipline; loyalty to the ideal of equality of opportunity has been too widely succeeded by a self-willed expression in which rights are divorced from duties, rewards from merits, . . . and an equalitarianism jealous of distinction and impatient of leadership. Class consciousness and group loyalties are crowding out social consciousness and concern for mankind.

Secondly, the survey found that we have been too concerned with economic values. There has been and still is a growing tendency to evaluate success in terms of social prestige associated with wealth and to place a "cash value" on education. This emphasis has been out of all proportion to that placed on those more enduring values which endow life with a genuine significance.

Are We Pseudo-Scientific?

The third characteristic of our society pointed out in this survey is the "pseudo-scientific" temper. We are accused of being enormously impressed by scientific inventions and apparent agreement of scientists; of accepting scientific truth as the only truth and disregarding moral values as merely conventional or individual whims. Because of these tendencies many younger members of society have become profoundly disillusioned.

Pharmacy might give serious thought to these viewpoints, principally because it has been economically concerned with specialization and technical training rather than with education for "a learned profession."

We are accustomed to thinking of the practical person as one whose actions are governed by use and experience as contrasted with ideals and philosophy. The more correct interpretation is the one which combines practice and experience with the ideal of usefulness. Since pharmacy lays claim to being a public health profession it should seek to apply its practice and experience to everyday living—for the greatest good of the greatest number. Unfortunately, this does not seem to be the impression of the public and many pharmacy graduates.

Classroom Plus

Education today should not be synonymous with what goes on in the classroom. Therefore, if practical pharmacy is to be the proving ground for knowledge and theories acquired in school, these two phases of the profession must find and apply the ways and means for reaching this end. Life may be likened to a pattern variegated in design and color, the woof of which is made up of an interweaving of experiences, conduct and their interpretation. If certain threads are removed or destroyed the color and meanings are altered because each fiber is so closely interwoven with another. The pattern differs for all depending on individual attitudes and ability to meet the problems of everyday living. Contrasted to this is the prevalent lack of integration of subject matter in our schools, an insistence on maintaining subject matter within boundaries or water-tight compartments. To illustrate: In the study of a crude drug too much emphasis cannot be placed on the composition or structure of the constituents because that belongs to the domain of pharmaceutical chemistry or pharmacognosy; while the physical properties of the drug's constituents are often mentioned offhand, if at all, since that problem must be reserved for a later course and place, namely, the dispensing laboratory. And dispensing, the one course which more than any one other identifies the profession to the laity and the one subject in which mathematics, physics, bacteriology, qualitative analysis, organic and inorganic chemistry, pharmacognosy and biology are intimately bound becomes many times a minor matter.

At the present time we hear much of a shortage of pharmacists, of accelerated programs aimed at

relieving these shortages. We are beset by statistics which seem to show alarming tendencies. Why do we always struggle for size? Why are we always so "numerically ambitious?" Those of us who interpret practical pharmacy in the light of a professional public service are convinced that the days of expansion are past. In order for pharmacy to take a leading part and make contributions to personal, community and national life it should discard the *idea* of quantity and replace it with the *ideal* of quality. Pharmacy can achieve a working understanding of life today and its problems by formulating and adopting some type of program by which theoretical pharmacy will utilize practical pharmacy.

A clearer understanding of some of the ways in which scientific methods and discoveries are affecting today's pharmacists may be gathered by following some plan similar to the one established several years ago by the Bureau of Educational Research in Science of Teacher's College, Columbia University. This bureau working with the aid of a general educational board coöperates with selected science teachers and with schools in which these teachers are employed. In addition to gaining a clearer understanding of the influence of scientific methods and discoveries on everyday life, it studies changes in ways of thinking, feeling and acting in both students and teachers. Through the curriculum workshop, established in connection with the bureau, use is made of reports prepared by research associates and those from other sources. In addition they have the assistance of specialists employed in areas under examination. The curriculum workshop methods of study allow a mature consideration of contemporary problems and these methods are not limited by pedagogical questions about methods. This has resulted in coöperating members acquiring ability to comprehend and a feeling of competence to take part in and make contributions which may have wide influence on community and national life. The main objective was to make a contribution to the education of its own members and teachers in order that they may offer younger people an

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opportunity to apply the best methods and resources in attacking contemporary problems which confront us.

The present crisis in pharmacy has been precipitated by a changing viewpoint through enlightening events. Pharmacy can take its place as a health profession by taking more time and including more in interpreting the profession to its young. Through the coöperation of such a bureau as has been described, prospective pharmacists could acquire not only skill in technique but an understanding of how democracies should work. The plan would include substitution of part of the college laboratory work for actual practice in the various divisions of pharmaceutical endeavor, that is, rural drug stores, urban professional stores, research laboratories, wholesale and manufacturing plants, hospital pharmacies and agencies of our public health service. Through actual contact students would meet some of the vital problems which democracy is trying to solve today, namely, public health and sanitation, child welfare, minority groups and racial prejudice.

In such ways we must guarantee a future leadership and intelligent membership which will not only know science but will be able to use it for the benefit of the body politic. To keep pace with the times we should realize that professional and technical training is not enough.

QUININE POOL FINISHES WAR JOB

PHARMACISTS WIN PRAISE FOR CONTRIBUTING 150,000 OUNCES OF CINCHONA PRODUCTS; CANADA INAUGURATES SIMILAR PROJECT

THE national quinine pool conducted by the AMERICAN PHARMACEUTICAL ASSOCIATION in coöperation with the Defense Supplies Corporation has completed its mission with the collection of approximately 150,000 ounces of cinchona products from pharmacists throughout the nation. Another shipment of 20 barrels of bulk salts has just been sent to the refining laboratory, and the second shipment of antimalarials in original containers is now in the hands of the Navy Bureau of Medicine and Surgery.

Most of the Army and Navy men who worked in the headquarters of the pool at the AMERICAN INSTITUTE OF PHARMACY have left for duty elsewhere. The last of the potent powder will likewise soon be dispatched for war service to help defeat the enemy—in this case, malaria, which some authorities rate on a par with Hitler and Hirohito as obstacles to victory.

The voluntary contribution of quinine stocks by America's pharmacists to help the war effort has won praise in leading magazines and newspapers and over the air. Canada has been interested in the project and now has a quinine pool of its own under way patterned after the plan used in the United States.

The nation's pharmacists have set a high mark for our northern neighbors to shoot at, having contributed approximately 17,400 shipments since last February. By March the quinine flood reached its peak when 4792 packages were opened by the men detailed to this duty from the Army's Walter Reed General Hospital and from the U. S. Naval Dispensary. During the peak activitity 25 persons were employed in unpacking, sorting and registering the drugs.

Some of the products received were manufactured in France, Switzerland, Italy, Germany, Japan, Peru, Ecuador and other South American countries. The largest contribution received came from the president of Peru, who sent 100 pounds of pure quinine sulfate to President Roosevelt. The President immediately forwarded the gift to the quinine pool.

In thanking the AMERICAN PHARMACEUTICAL ASSOCIATION for its part in the war effort, President Roosevelt recently stated that the "high spot of this has been the collection of small quinine stocks throughout our nation."

The care with which each pharmacist's contribution was handled is related by Robert R. Price, C.Ph.M. of the U. S. Navy, who was on duty at the quinine pool. Each package, regardless of size, was checked for the name and address of the donor so that proper acknowledgment and the special "V" certificate could be forwarded to the pharmacist. The next worker emptied the package and put the bottles and boxes in order,

so each quinine derivative could be properly checked. A sheet record was made for each donation showing the donor's name and address, and the different quinine derivatives in the donation listed by name and amount.

Medication forms received included capsules, pills, tablets, cachets, liquids, powders, crystals, ampuls, compounds and crude cinchona bark.

As can be noted in the following table prepared from the official records, the contributions included almost every cinchona derivative a pharmacist could imagine.

QUININE AND DERIVATIVES

Alkaloid	Glycerinophosphate
Arsenate	Guaiacol sulfonate
Arsenite	Hydrobromate
Bihydrochloride	Hydrobromide
Bisalicylosalicylate	Hydrochloride
Bisulfate	Hypophosphate
Bromide	Iodide
Cacodylate	Lactate
Carbolate	Nitrate
Carbonate	Oleate
Chloride	Phenate
Chlorohydrosulfate	Phenolsulfonate
Citrate	Phosphate
Dextro-	Salicylate
Dihydrochlorate	Sulfate
Dihydrochlorite	Sulfocarbolate
Ethyl-carbonate	Tannate
Ferrocyanide	Valerate
formate	

CINCHONINE AND DERIVATIVES

Alkaloid	Salicylate
Bisulfate	Sulfate

CINCHONIDINE AND DERIVATIVES

Alkaloid	Salicylate
Hydrobromide	Sulfate

CINCHONA AND DERIVATIVES

Red Bark	Yellow Bark

Besides these salts there were a host of miscellaneous compounds. After all such information was down on the record sheet, the amounts were converted so that all entries were made in grains. The total grainage was then logged in the record book under the proper derivative heading. After the required records were completed, each derivative was placed in the properly marked container.

Containers with unbroken seals were later rechecked by authorized government officials, and when the unopened condition could be verified, such packages were prepared for shipment directly to the armed forces. All others were dumped into barrel-sized containers to be sent for reprocessing, thus assuring complete purity.

As the national quinine pool closes its books with a total of more than six and a half million 10-grain doses, it is certain that each fighting man that receives his share of this antimalarial ammunition would like to walk into the pharmacy of his supporter on the home front and express his appreciation.

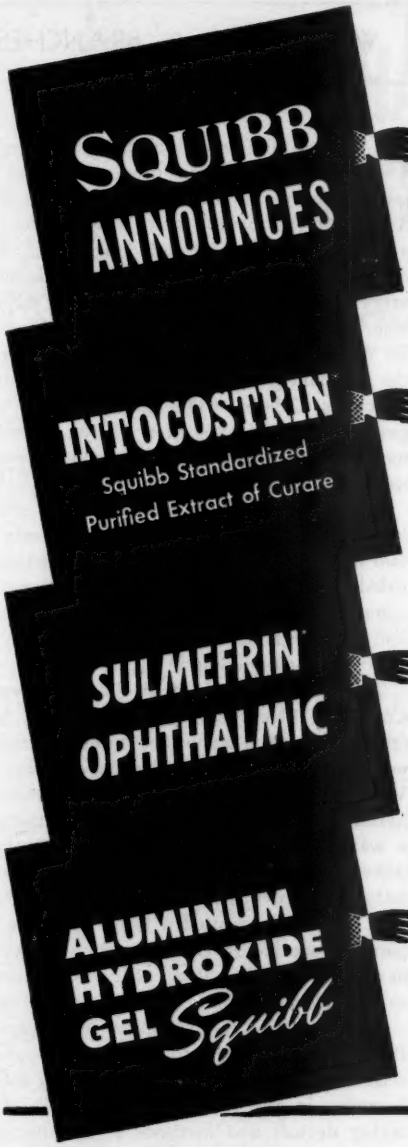
DEMEROL NOW AVAILABLE, CALLED VERSATILE ANALGETIC

Demerol, the synthetic analgetic recently released for use on prescription, was described as having "a wide range of usefulness and possessing many advantages over morphine," by Dr. Robert C. Batterson of the New York University College of Medicine in a report to the Connecticut Clinical Congress. His observations were based on the clinical use of demerol on more than 4000 patients at Bellevue Hospital during the past two and a half years.

Relief of pain after operations, for minor surgical procedures, fractures, abscesses, carbuncles, burns, pleuritic and arthritic pains, chronic nerve pains and labor pains in obstetrics were among the uses cited.

Compared with morphine, demerol has slightly less analgetic properties and shorter duration of action, but also a lower incidence of toxicity. Habituation is possible but demerol was said to possess "a lesser liability than any opiate for the development of physical dependence."

Pharmacologically the drug resembles a morphine alkaloid with additional slight atropine-like properties. Moderately intense pain is controlled with 50 to 100 mg. every four hours, according to Dr. Batterson, and with severe pain as much as 150 mg. may be given every three hours. With the exception of cerebral irritability when large doses are administered, demerol is relatively safe. In contrast to the opiates, the physicians were told, there is little danger of cumulation of undesirable effects such as respiratory depression, deep narcosis, urinary retention or constipation.



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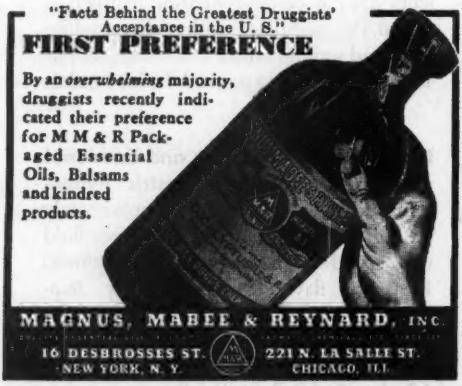
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WITH A. PH. A. BRANCHES

PLANS for the Remington Medal dinner meeting, December 7, were discussed at the November meeting of the New York branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, and a list of outstanding speakers announced. Tribute was paid to the late Dr. H. V. Arny, known to every pharmacist for his *Principles of Pharmacy*, who died on Nov. 3, 1943. Principal speaker for the evening was Mrs. Goldie R. Kaback of the Guidance and Personnel Department at Teacher's College, Columbia University, who gave a scientific exposition of the Rorschach method of personality diagnosis which is widely used for personnel selection.

On the other side of the nation, the student branch at Washington State College reports that two films were shown at their last meeting entitled "Work of the Kidneys" and "Mission Accomplished." Student activities were discussed and Dean Dirstine mentioned the possibility of a new pharmacy building in the near future.

The student branch at St. John's University College of Pharmacy, Brooklyn, N. Y., heard Otto Richeimer, a senior, discuss his experiments on "The Adaptability of Vanishing Cream as a Vehicle for Antiseptic Substances." His results indicated that substances of antiseptic nature in a water-soluble base have greater penetrating power, and more pronounced action, than in the fatty base provided in the U. S. P. and N. F. Alex Podolak presented a table which he prepared of specific gravities for isopropyl alcohol in distilled water, a subject of increasing interest as ethyl alcohol supplies become more limited.

Pharmacists at the November meeting of the Philadelphia branch heard Herbert Flack, pharmacist of the New York Hospital, discuss "Manufacturing in the Hospital Pharmacy." Time-saving devices and methods of manufacturing were described.

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